

Appl. No. 10/605,377  
Amdt. dated November 01, 2005  
Reply to Office action of August 02, 2005

### **REMARKS/ARGUMENTS**

#### **Regarding amendments to the claims:**

Claims 1-16 are amended to overcome the objections set forth on the following detailed Office action, emphasize the characteristics of the claimed invention, and in the interests of  
5 clarity is reproduced above in toto. No new matter is entered by the above amendments.

#### **Regarding rejections under 35 U.S.C. 102**

##### **Examiner:**

- 10 1. Claims 1-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen (US Pat. 6274281) or Lin et al. (6077633), and rejected under 35 U.S.C. 102(e) as being anticipated by Wu (6759328).

Chen teaches a contact hole mask, comprising: a transparent mask substrate having a first number of first contact hole regions and a second number of second contact hole regions wherein each of said first contact hole regions have a first width and a first  
15 outer perimeter and each of said second contact hole regions have a second width and a second outer perimeter; a first thickness of light absorbing material formed on that part of said transparent mask substrate not covered by said first number of first contact hole regions and said second number of second contact hole regions, wherein said first thickness of said light absorbing material has a first transmittance; a second  
20 thickness of said light absorbing material formed on each of said first contact hole regions of said transparent mask substrate, wherein said second thickness of said light absorbing material has a second transmittance; and a third thickness of transparent phase shifting material formed on said first thickness of said light absorbing material covering that part of said transparent mask substrate not covered by said first number  
25 of first contact hole regions and said second number of second contact hole regions, wherein said third thickness of said transparent phase shifting material produces a phase shift of 180 degree.

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Lin et al. teach a contact hole mask comprising: a transparent mask substrate having a first region and a second region; a patterned layer of attenuating phase shifting material formed on said transparent mask substrate, wherein said patterned layer of attenuating phase shifting material has first holes and second holes formed therein, said first holes are over said first region of said transparent mask substrate, and said second holes are over said second region of said transparent mask substrate; and a patterned layer of opaque material formed on said patterned layer of attenuating phase shifting material, wherein said patterned layer of opaque material has first holes and second holes formed therein, said first holes in said patterned layer of opaque material have the same size and shape as said first holes in said layer of attenuating phase shifting materials said first holes in said opaque material are directly over said first holes in said attenuating phase shifting material, said second holes in said opaque material are directly over said second holes in said attenuating phase shifting materials, and said second holes in said opaque material are larger than said second holes in said attenuating phase shifting material thereby exposing a gap width of said attenuating phase shifting material around the periphery of said second holes in said layer of attenuating phase shifting material.

Wu teaches an exposure method of a contact hole, comprising: providing a mask including a transparent substrate, a phase shift layer installed on the transparent substrate to define a series of patterns having contact hole areas arranged in array, and a plurality of metal lines installed on the phase shift layer between the adjacent contact hole areas, wherein the pitch between the contact hole areas is about 300-600 nm and performing an exposure by transmitting a light source through the mask after the metal lines absorb high degree diffraction waves; wherein the metal lines are substantially thinner than the pitch between the contact hole areas, equidistant from the contact holes, and installed on the phase shift layer in an orthogonal grid pattern.

**Response:**

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According to the amended claims 1 and 9, the claimed invention teaches a lithography method of first providing a phase shift mask, in which the phase shift mask includes a plurality of first phase shift transparent regions, a plurality of second phase shift transparent regions having a phase shift relative to the first phase shift transparent regions, and a non-phase shift region. Preferably, the first phase shift transparent regions and the second phase shift transparent regions are alternately disposed, and each of the first phase shift transparent regions and each of the second phase shift transparent regions are separated by the non-phase shift region. In other words, the first phase shift transparent regions and the second phase shift transparent regions of the claimed invention are alternately disposed and a phase shift is created between each of the first phase shift transparent regions and the second phase shift transparent regions, in which no phase shift is present between each of the first and second phase shift transparent regions and the non-phase shift region.

In contrast to the claimed invention, the contact holes (corresponding to the first phase shift transparent regions and the second phase shift transparent regions of the claimed invention) disclosed by Chen, Lin et al, and Wu are not alternately disposed and no phase shift is present between each of the contact holes. Instead, phase shifts are present between the contact holes and the area surrounding the contact holes, which correspond to the non-phase shift region of the claimed invention. Hence, despite the fact that the contact holes disclosed by Chen, Lin et al, and Wu are separated by a surrounding opaque region, in which the contact holes have a phase shift relative to the opaque region, no phase shift is present between each of the contact holes as suggested in the claimed invention.

According to Chapter 2112 in the MPEP, in relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Since the inherency of a lithography method having a plurality of

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first phase shift transparent regions, a plurality of second phase shift transparent regions having a phase shift relative to the first phase shift transparent regions, and a non-phase shift region separating the two phase shift transparent regions does not flow from the teachings of Chen, Lin et al and Wu, the amended claims 1 and 9 should be novel based on the above  
5 analysis, and since the claims 2-8 are dependent upon claim 1 and the claims 10-16 are dependent upon claim 9, the claims 2-8 and 10-16 should be allowed if claims 1 and 9 are allowed. Reconsideration of the amended claims 1 and 9 is politely requested.

Applicant respectfully requests that a timely Notice of Allowance be issued in this  
10 case.

Sincerely yours,

15 Winston Hsu Date: Nov. 01, 2005

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